

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of :
Satoshi KONDO et al. :
Serial No. NEW : **Attn: Application Branch**
Filed January 19, 2001 : **Attorney Docket No. 2001-0040A**

IMAGE PROCESSING METHOD AND
IMAGE PROCESSING APPARATUS

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

Prior to examination of the above-referenced U.S. Patent application please amend the application as follows:

IN THE CLAIMS

9. (Amended) An image processing method as defined in Claim 1 further comprising:
image decoding step of decoding an image code sequence to generate a decoded image;
said noise detection step of performing noise detection using information included in the
image code sequence; and
said noise removal step of removing noise from the decoded image obtained in the image
decoding step, on the basis of the result of the noise detection.

10. (Amended) An image processing method as defined in Claim 1, wherein said noise
is one of blocking artifact and ringing artifact.

11. (Amended) An image processing method as defined in Claim 1, wherein the predetermined region to be subjected to noise removal in the noise removal step is an assembly of pixels in the vicinity of a boundary of each block.

20. (Amended) An image processing apparatus as defined in Claim 12 further comprising:
image decoding means for decoding an image code sequence to generate a decoded image;
said noise detection means receiving the image code sequence, and performing noise detection using information included in the image code sequence; and
said noise removal means removing noise from the decoded image outputted from the image decoding means, on the basis of the result of the noise detection.

21. (Amended) An image processing apparatus as defined in Claim 12, wherein said noise is one of blocking artifact and ringing artifact.

22. (Amended) An image processing apparatus as defined in Claim 12, wherein the predetermined region to be subjected to noise removal by the noise removal means is an assembly of pixels in the vicinity of a boundary of each block.

Please add the following new claims:

--23. An image processing method as defined in Claim 2 further comprising:
image decoding step of decoding an image code sequence to generate a decoded image;
said noise detection step of performing noise detection using information included in the image code sequence; and
said noise removal step of removing noise from the decoded image obtained in the image decoding step, on the basis of the result of the noise detection.

24. An image processing method as defined in Claim 3 further comprising:

image decoding step of decoding an image code sequence to generate a decoded image;
said noise detection step of performing noise detection using information included in the
image code sequence; and
said noise removal step of removing noise from the decoded image obtained in the image
decoding step, on the basis of the result of the noise detection.

25. An image processing method as defined in Claim 4 further comprising:
image decoding step of decoding an image code sequence to generate a decoded image;
said noise detection step of performing noise detection using information included in the
image code sequence; and
said noise removal step of removing noise from the decoded image obtained in the image
decoding step, on the basis of the result of the noise detection.

26. An image processing method as defined in Claim 5 further comprising:
image decoding step of decoding an image code sequence to generate a decoded image;
said noise detection step of performing noise detection using information included in the
image code sequence; and
said noise removal step of removing noise from the decoded image obtained in the image
decoding step, on the basis of the result of the noise detection.

27. An image processing method as defined in Claim 6 further comprising:
image decoding step of decoding an image code sequence to generate a decoded image;
said noise detection step of performing noise detection using information included in the
image code sequence; and
said noise removal step of removing noise from the decoded image obtained in the image
decoding step, on the basis of the result of the noise detection.

28. An image processing method as defined in Claim 2, wherein said noise is one of blocking artifact and ringing artifact.

29. An image processing method as defined in Claim 3, wherein said noise is one of blocking artifact and ringing artifact.

30. An image processing method as defined in Claim 4, wherein said noise is one of blocking artifact and ringing artifact.

31. An image processing method as defined in Claim 5, wherein said noise is one of blocking artifact and ringing artifact.

32. An image processing method as defined in Claim 6, wherein said noise is one of blocking artifact and ringing artifact.

33. An image processing method as defined in Claim 2, wherein the predetermined region to be subjected to noise removal in the noise removal step is an assembly of pixels in the vicinity of a boundary of each block.

34. An image processing method as defined in Claim 3, wherein the predetermined region to be subjected to noise removal in the noise removal step is an assembly of pixels in the vicinity of a boundary of each block.

35. An image processing method as defined in Claim 4, wherein the predetermined region to be subjected to noise removal in the noise removal step is an assembly of pixels in the vicinity of a boundary of each block.

36. An image processing method as defined in Claim 5, wherein the predetermined region to be subjected to noise removal in the noise removal step is an assembly of pixels in the vicinity of a boundary of each block.

37. An image processing method as defined in Claim 6, wherein the predetermined region to be subjected to noise removal in the noise removal step is an assembly of pixels in the vicinity of a boundary of each block.

38. An image processing apparatus as defined in Claim 13 further comprising:
image decoding means for decoding an image code sequence to generate a decoded image;
said noise detection means receiving the image code sequence, and performing noise detection using information included in the image code sequence; and
said noise removal means removing noise from the decoded image outputted from the image decoding means, on the basis of the result of the noise detection.

39. An image processing apparatus as defined in Claim 14 further comprising:
image decoding means for decoding an image code sequence to generate a decoded image;
said noise detection means receiving the image code sequence, and performing noise detection using information included in the image code sequence; and
said noise removal means removing noise from the decoded image outputted from the image decoding means, on the basis of the result of the noise detection.

40. An image processing apparatus as defined in Claim 15 further comprising:
image decoding means for decoding an image code sequence to generate a decoded image;
said noise detection means receiving the image code sequence, and performing noise detection using information included in the image code sequence; and
said noise removal means removing noise from the decoded image outputted from the image decoding means, on the basis of the result of the noise detection.

41. An image processing apparatus as defined in Claim 16 further comprising:
 image decoding means for decoding an image code sequence to generate a decoded image;
 said noise detection means receiving the image code sequence, and performing noise detection
 using information included in the image code sequence; and
 said noise removal means removing noise from the decoded image outputted from the image
 decoding means, on the basis of the result of the noise detection.

42. An image processing apparatus as defined in Claim 17 further comprising:
 image decoding means for decoding an image code sequence to generate a decoded image;
 said noise detection means receiving the image code sequence, and performing noise detection
 using information included in the image code sequence; and
 said noise removal means removing noise from the decoded image outputted from the image
 decoding means, on the basis of the result of the noise detection.

43. An image processing apparatus as defined in Claim 13, wherein said noise is one of
 blocking artifact and ringing artifact.

44. An image processing apparatus as defined in Claim 14, wherein said noise is one of
 blocking artifact and ringing artifact.

45. An image processing apparatus as defined in Claim 15, wherein said noise is one of
 blocking artifact and ringing artifact.

46. An image processing apparatus as defined in Claim 16, wherein said noise is one of
 blocking artifact and ringing artifact.

47. An image processing apparatus as defined in Claim 17, wherein said noise is one of
 blocking artifact and ringing artifact.

48. An image processing apparatus as defined in Claim 13, wherein the predetermined region to be subjected to noise removal by the noise removal means is an assembly of pixels in the vicinity of a boundary of each block.

49. An image processing apparatus as defined in Claim 14, wherein the predetermined region to be subjected to noise removal by the noise removal means is an assembly of pixels in the vicinity of a boundary of each block.

50. An image processing apparatus as defined in Claim 15, wherein the predetermined region to be subjected to noise removal by the noise removal means is an assembly of pixels in the vicinity of a boundary of each block.

51. An image processing apparatus as defined in Claim 16, wherein the predetermined region to be subjected to noise removal by the noise removal means is an assembly of pixels in the vicinity of a boundary of each block.

52. An image processing apparatus as defined in Claim 17, wherein the predetermined region to be subjected to noise removal by the noise removal means is an assembly of pixels in the vicinity of a boundary of each block.--

REMARKS

The present Preliminary Amendment is submitted to delete the multiple dependency of the claims, thereby placing such claims in condition for examination and reducing the required PTO filing fee

Attached hereto is a marked-up version of the changes made to the claims by the current Preliminary Amendment. The attached page is captioned "**VERSION WITH MARKINGS TO SHOW CHANGES MADE**".

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

8. An image processing method as defined in Claim 6, wherein the image composition step comprises cutting partial images of the same region from the image before being subjected to noise removal in the noise removal step and the image from which noise has been removed, respectively, and generating an image in which the partial images are arranged vertically or horizontally.

9. An image processing method as defined in ~~any of Claims 1 to 6~~ further comprising:

image decoding step of decoding an image code sequence to generate a decoded image;

said noise detection step of performing noise detection using information included in the image code sequence; and

said noise removal step of removing noise from the decoded image obtained in the image decoding step, on the basis of the result of the noise detection.

10. An image processing method as defined in ~~any of Claims 1 to 6~~, wherein said noise is one of blocking artifact and ringing artifact.

11. An image processing method as defined in ~~any of Claims 1 to 6~~, wherein the predetermined region to be subjected to noise removal in the noise removal step is an assembly of pixels in the

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vicinity of a boundary of each block.

12. An image processing apparatus comprising:

noise detection means for performing noise detection on an input image;

noise removal means for removing noise from a predetermined region of the input image, on the basis of the result of the noise detection;

arithmetic means for obtaining the ratio of an area targeted for noise removal to the predetermined region of the input image, on the basis of the result of the noise detection; and

image generation means for generating an image indicating the ratio, on the basis of the ratio obtained by the arithmetic means.

13. An image processing apparatus comprising:

noise detection means for performing noise detection on an input image;

noise removal means for removing noise from a predetermined region of the input image, on the basis of the result of the noise detection;

arithmetic means for obtaining the ratio of an area targeted for noise removal to the predetermined region of the input image, from the result of the noise detection;

statistics calculation means for obtaining the statistics on the ratios obtained by the arithmetic means over a predetermined

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18. An image processing apparatus as defined in Claim 16, wherein the intensity of the noise detected by the noise detection means is only one, and the color of the image generated by the image generation means is only one.

19. An image processing apparatus as defined in Claim 17, wherein the image composition means cuts partial images of the same region from the input image and the output image from the noise removal means, respectively, and generates an image in which the partial images are arranged vertically or horizontally.

20. An image processing apparatus as defined in ~~any of~~ Claims ^g12 to 17 further comprising:

image decoding means for decoding an image code sequence to generate a decoded image;

said noise detection means receiving the image code sequence, and performing noise detection using information included in the image code sequence; and

said noise removal means removing noise from the decoded image outputted from the image decoding means, on the basis of the result of the noise detection.

21. An image processing apparatus as defined in ~~any of~~ Claims ^g12 to 17, wherein said noise is one of blocking artifact and ringing

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artifact.

22. An image processing apparatus as defined in ~~any of~~ Claims 12 ¹
~~to 17~~, wherein the predetermined region to be subjected to noise
removal by the noise removal means is an assembly of pixels in
the vicinity of a boundary of each block.

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